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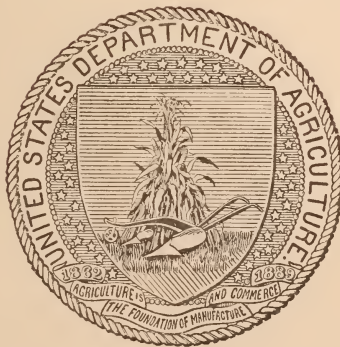
U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF ENTOMOLOGY.
L. O. HOWARD, Entomologist and Chief of Bureau.

PAPERS ON COCCIDÆ OR SCALE INSECTS.

NEW SPECIES OF
DIASPINE SCALE INSECTS.

By C. L. MARLATT, M. S.,
Entomologist and Assistant Chief of Bureau.

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PAPERS ON COCCIDÆ OR SCALE INSECTS.

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INTRODUCTORY.

The species described below as new to science are mostly insects of potential economic importance, as indicated by place of origin and host plants. The facts concerning each of these species in these particulars are given in the notes accompanying the descriptions.

Of the seventeen species listed, four are apparently native to this continent, and the rest are foreign. Of the latter, five species have been found on living plants recently imported from foreign countries. Two of these, *Leucaspis indica* and *Parlatoria mangiferæ*, attack mango. The former is established in mango plantings in Florida and Porto Rico, and the latter is found more or less generally infesting the mango nursery stock in the Department greenhouses. A vigorous effort is being made to exterminate both of these scale insects. *Parlatoria pyri* infested cuttings of apple and soft pear imported from Manchuria, and might easily become a pest second only to the San Jose scale in importance. All of the infested cuttings were burned, and the entire stock was thoroughly fumigated. *Parlatoria chinensis* infested *Xanthoxylon*, *Thuja*, and *Zizyphus* sp. imported from China, and is closely related to *pyri*. Both of these *Parlatorias* were collected by the writer in China in 1901. *Aspidiotus meyeri* infested an *Abies* imported from the region of Peking, China. The rest of the foreign material came to the Department for determination from various collectors as dry, dead specimens, and the danger of the introduction of these species is a future one. Of the latter, the ones presenting the greatest danger to this country are *Aspidiotus cocotiphagus*, which in Cuba infests the cocoanut and trifoliate orange, and is doubtless capable of developing a wide range of food plants, and *Aspidiotus africanus*, which is making in South Africa a reputation very similar to that of the San Jose scale in this country.

Credit is due Mr. J. G. Sanders, of this Bureau, who made the photomicrographs of the anal plates of the species described in this paper. While it does not seem possible to get a photograph which will show satisfactorily all the structural characters of the anal plate, these photographs are still very helpful as supplementing the text, and give a general pictorial effect which it is impossible to convey by description.

ASPIDIOTUS (s. str.) COMPEREI n. sp.

• (Plate I, fig. 1.)

Scale of female: About 1 mm. in diameter, strongly convex, nearly circular. Exuviae covered, but covering secretion easily rubbed off, exposing the lemon-yellow to brown exuviae. Secretion covering the larval exuvia sometimes more dense and adherent, thus sometimes giving the scale an annulated appearance due to the second exuvia showing through the section surrounding the larval skin. Secretionary supplement normally white, sometimes slightly yellowed. Ventral scale inconsiderable.

Scale of male: About one-half the size of the female scale, and of the normal oval shape.

Adult female: In balsam mount, nearly circular and hyaline, with a diameter of about 0.8 mm.; *anal plate* broad, rounded, about 0.2 mm. long by 0.3 mm. broad, for the most part hyaline, apical third very slightly suffused or chitinized; three pairs of very small, narrow, subequal lobes; median lobes rectangular and more heavily chitinized than laterals, and with chitinization, not sharply limited, extending into the pygidium something more than a lobe's length; lateral lobes with distinct outer shoulder and somewhat constricted at base, hyaline; a projection is sometimes seen at some distance anterior to the third lobe having the appearance of a rudimentary fourth lobe; incisions shallow, given a truncate appearance by the occurrence of marginal pores; paraphyses wanting; plates about lobe length, inconspicuous, apparently two median, two in first incision, and three in second incision, with some additional rudimentary plates beyond second lateral incision; spines normal; anal opening oval, very large, larger than the two median lobes together, remote from tip, near center of the segment; paragenitals represented only by the anterior lateral groups, which consist of from 1 to 4 (usually 2) glands; dorsal glands small and rather numerous, limited to the apical third of the margin of the segment; basal thickenings wanting; ventral thickenings not present as a divaricating band from the tip, but represented by the uniform chitinous suffusion of the apical third of the segment.

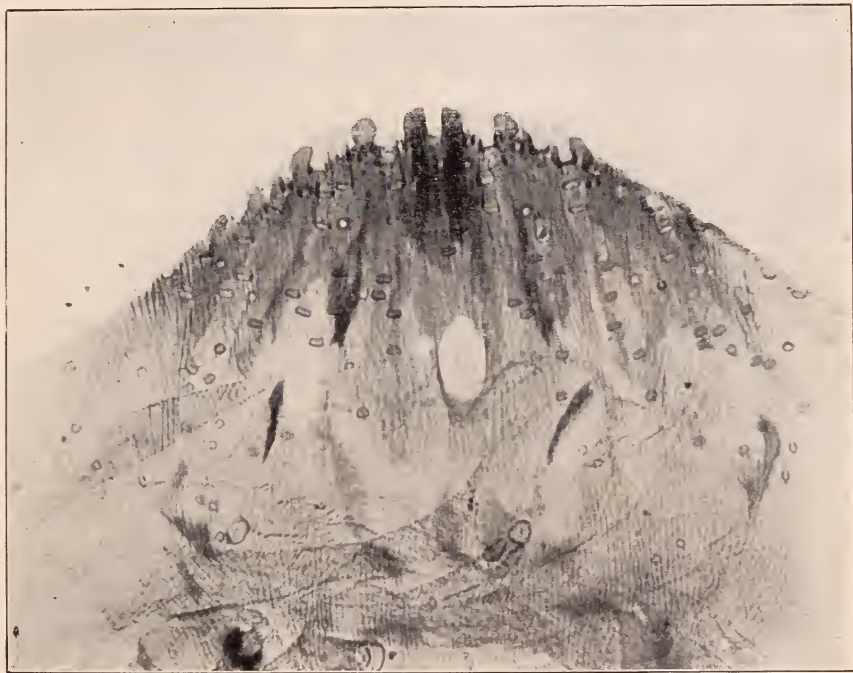


FIG. 1.—ASPIDIOTUS (S. STR.) COMPEREI.

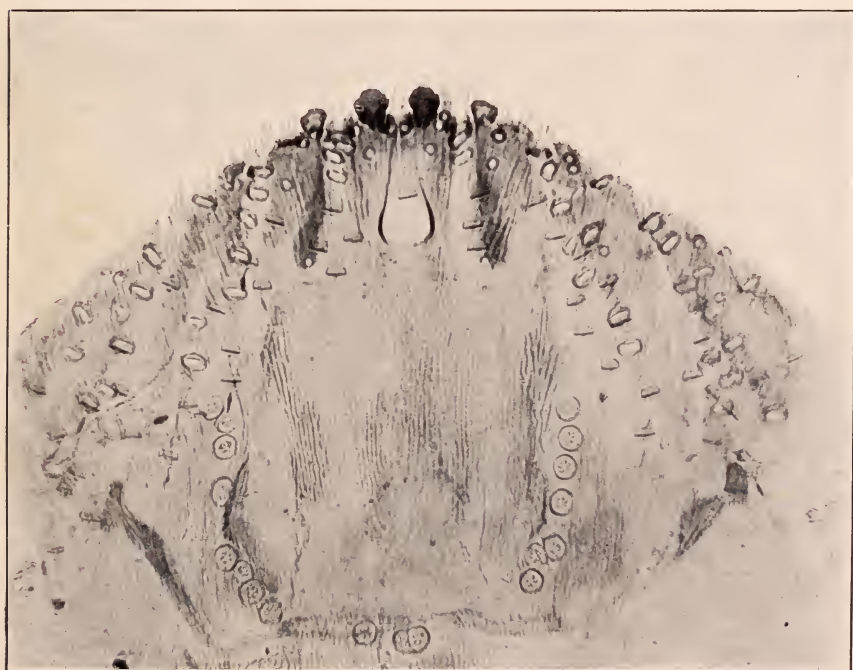


FIG. 2.—ASPIDIOTUS (S. STR.) MEYERI.

Type.—Bureau of Entomology No. 14129. On *Hake* sp. and an undetermined plant. Raventhorpe, West Australia, collected by George Compere (Nos. 968 and 990), received at the Department February, 1902.

NOTE.—This species in scale characteristics and large anal orifice reminds one of *Aspidiotus camelliæ* Sign.; in its pygidial characters it is more like *A. destructor* Sign. It differs distinctly, however, from both of these species, as indicated in the description. It occurs massed rather thickly on the smaller twigs of the two food plants. It does not seem to coincide with any of the species described by Maskell, although, when Maskell's types are examined, it may fall to one of his species.

ASPIDIOTUS (s. str.) MEYERI n. sp.

(Plate I, fig. 2.)

Scale of female: Elongate oval, 1.5 to 2 mm. (or more) in length; very convex; exuviae subcentral; larval secretion whitish except as obscured by extraneous matter; main or subsequent secretion dull resinous brown; larval secretion and exuvia easily lost, exposing the large, bright orange colored second exuvia; scale adhering very loosely to the leaf and easily dislodged, leaving the insect exposed; inner surface of scale covered with snow-white secretion which entirely conceals the exuviae.

Scale of male: Not certainly identified, but apparently the same general type as female, except as to size and number of exuviae.

Adult female: Long, oval, distinctly robust or convex, 0.7 to 0.9 mm. broad by 1 to 1.4 mm. long; hyaline in balsam mount; *anal plate* broad, rounded, in general hyaline, 0.32 mm. broad by 0.20 mm. long; two pairs of simple normal lobes, median largest and most chitinized, 0.012 mm. in diameter; both lobes with two minute shoulders, often worn, and shoulders obscure; some distance beyond the second lobe is a very low, rudimentary, lobular projection, with difficulty distinguished, terminating in a nipple or pointed tip; lateral teeth wanting; incisions moderate, normal; paraphyses practically wanting; plates lower than lobes, broad, many-branched; 2, 2, 3, and, following the rudimentary lateral lobe, 4 or 5 narrow, branched plates; spines very short and inconspicuous; anal opening large, circular, 0.2 mm. in diameter, larger than a single median lobe and about two lobes distant from base of lobes; paragenitals in five groups, 2-4, 3-3, 3-4; dorsal pores large and conspicuous, in rows counting from the center as follows: 3-4, 5-7, 6-7, with a few additional pores in obscure rows of 2, 3, or 4 pores each; basal thickenings represented by two narrow median transverse rods, and the

widely separated oblique lateral thickenings; ventral thickenings normal, but slightly chitimized.

Type.—Bureau of Entomology No. 14137. On *Abies* sp., imported by F. N. Meyer, for the Bureau of Plant Industry, from Wu Tai Shan, near Peking, China, received April 21, 1908.

NOTE.—This insect occurs quite abundantly on the short leaves of the *Abies*. It is closely allied to *abietis* Schrank, but diverges from the latter in some easily recognizable structural features. The margin of the anal segment beyond the second incision presents but one lobular projection instead of two, as is the case with *abietis*; and, furthermore, in *abietis* these projections are more produced and are finely serrate on the oblique outer margin.

ASPIDIOTUS (AONIDIELLA) COCOTIPHAGUS n. sp.

(Plate II, figs. 1, 2.)

Scale of female: Subcircular, 1.6 to 2 mm. in diameter; light yellowish brown, with a very minute central white tubercle; exuviae central, larval 0.35 mm. in diameter; second stage, 0.75 mm. in diameter.

Scale of male: Similar in color to the female, oval, a little over a millimeter long by 0.7 mm. wide; both male and female secretions moderate, translucent.

Adult female: Subcircular, 1.2 mm. in diameter; the older or spent females with the anal segment usually retracted, giving a kidney shape to the insect as in *aurantii*; the inflated cephalo-thoracic and abdominal segments, except the anal plate, are also strongly chitimized as in *aurantii*; *anal plate* with basal lobules, 0.4 mm. in diameter, but slightly chitimized, rounded; median lobes largest, chitimized, brown, together measuring a little less than 0.04 mm.; second and third lobes much smaller; median lobes with two shoulders; inner shoulder of the second and third lobes minute, sometimes absent in the case of the third lobe, outer shoulders distinct; three low, serrated areas beyond third incision, not always apparent; the posterior point, however, of the first area chitimized, and sometimes assuming the form of a rudimentary third lateral lobe; incisions normal; paraphyses shorter than lobes, narrow, the one extending from the inner base of the median lobes most prominent; plates in median and first and second lateral incisions respectively 2, 2, 3, in length variable, sometimes slightly exceeding lobes, deeply forked at tips; three broad plates in the third incision, oblique at apex, each terminating at the posterior angle in a long spindle-shaped tail; anal opening about the size of the first lateral lobe and about two lobes' length distant from tip; paragenitals 0-1, 3-8, 3-5, scattering; dorsal pores in two prominent rows, extending respectively from the second and third incisions, of 6 to 10 pores each; there are also some scattering lateral pores; basal

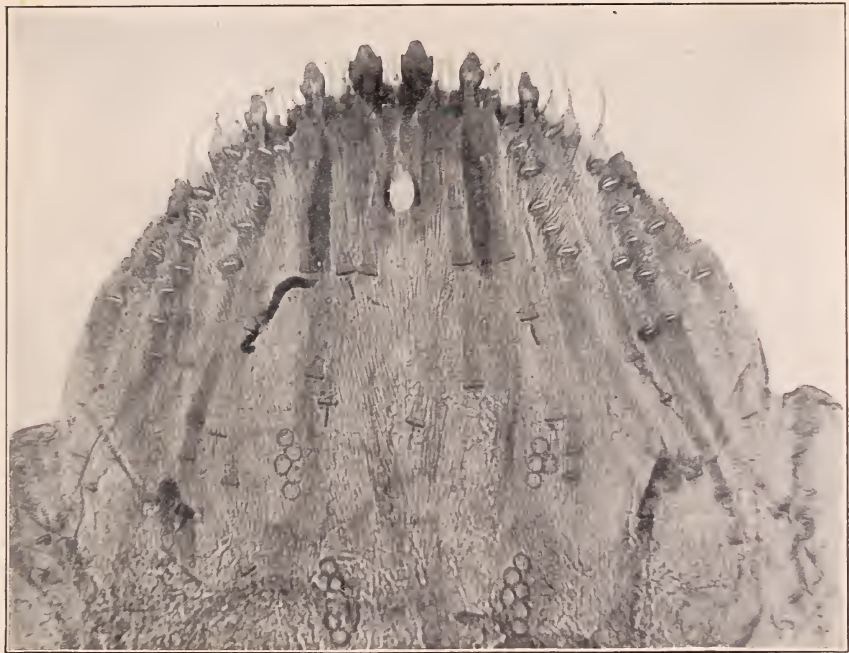
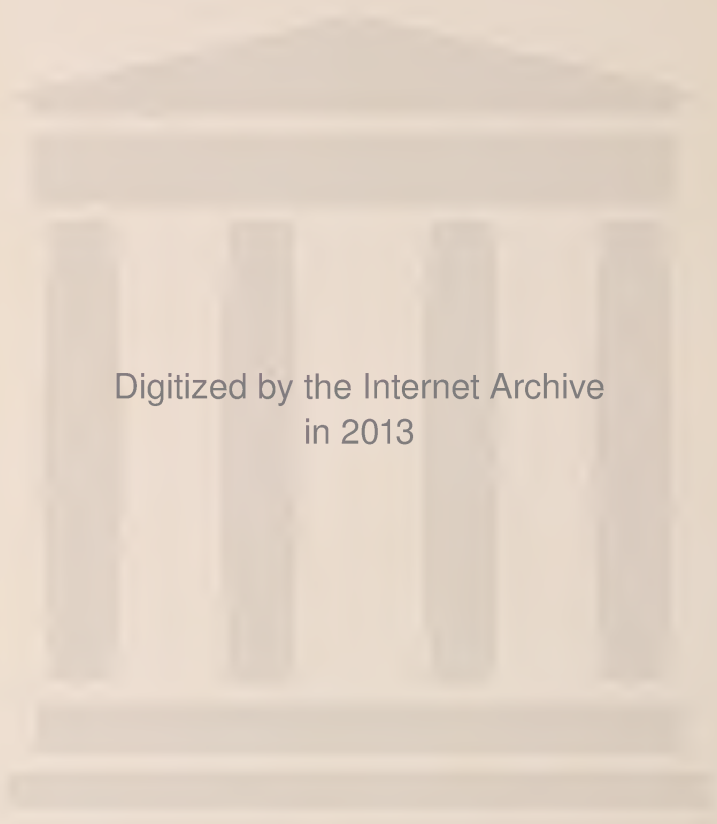


FIG. 1.—ASPIDIOTUS (AONIDIELLA) COCOTIPHAGUS.



FIG. 2.—ASPIDIOTUS (AONIDIELLA) COCOTIPHAGUS.

ANAL PLATES OF NEW SCALE INSECTS.



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FIG. 1.—ASPIDIOTUS (DIASPIDIOTUS) AFRICANUS.

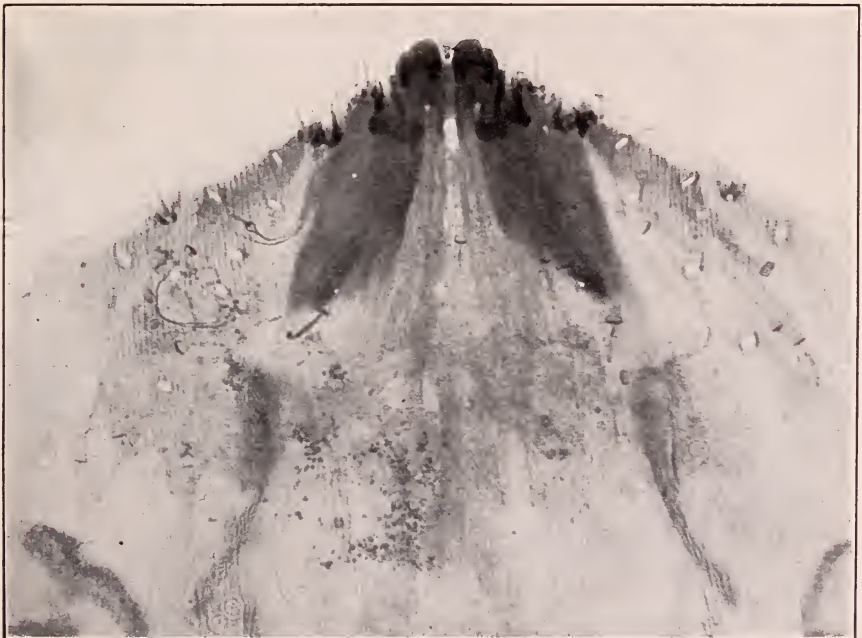


FIG. 2.—ASPIDIOTUS (DIASPIDIOTUS) COURSETIÆ.

ANAL PLATES OF NEW SCALE INSECTS.

thickenings slight, two short central rods and a larger lateral rod; ventral thickenings inconspicuous, represented chiefly by a chitinized line on each side below the first lateral incision.

Type.—Bureau of Entomology No. 14136. Massed on the upper surface of the leaves of cocoanut (*Cocos nucifera*), Santiago de las Vegas, Cuba, collected August, 1904, by Wm. T. Horne, chief of the department of vegetable pathology of the central agricultural experiment station of Cuba. Also on *Citrus trifoliata*, collected by Mr. Horne, Santiago de las Vegas, Cuba, January 13, 1906.

NOTE.—This species seems to be an intermediate one between *Aspidiotus* (*Aonidiella*) *aurantii* and *Aspidiotus* (*Chrysomphalus*) *dictyospermi*. It, however, differs distinctly from both of these species; from *aurantii* by notable differences in the pores, plates, and the presence of paragenitals, and from *dictyospermi* in the shape of the adult female and of the anal plate, and in the character and shape of the plates and lobes. In *aurantii* all the plates are distinctly subbranched and the three broad plates of the third incision have each two prominent apical branches which are distinctly subbranched. In *dictyospermi* the anal plate is much more produced and with much longer paraphyses, and of the three plates of the third incision the two posterior have long, spindle-shaped branches, the anterior plate two short branches. There is a distinct difference also in the shape of the lobes.

The specific variation in point of length of plates relative to lobes, and size of the lobes, position of the anal opening, etc., is illustrated in the two photographs of the anal segment shown on Plate II. The upper figure is from type material on cocoanut and the lower from trifoliolate orange.

ASPIDIOTUS (DIASPIDIOTUS) AFRICANUS n. sp.

(Plate III, fig. 1.)

Scale of female: Dull opaque brown, 1.5 mm. in diameter; circular, moderately convex, with fairly prominent central nipple, and slightly annulated as in *perniciosus*; when rubbed, resinous exuviae appear, and when old and massed the ashen appearance of *perniciosus* is presented.

Scale of male: About 1 mm. long, of normal type.

Adult female: 1 mm. long, oval. *Anal plate* 0.32 mm. broad at base by 0.2 mm. long, normal, not produced. Median lobes like those of *ancylus*, slightly converging toward tip; inner notch practically wanting; lateral lobes wanting or rudimentary, as in the case of *ancylus*; two distinct lateral incisions; paraphyses of first incision heavy, subequal, inner slightly largest; paraphyses of second incision much smaller; minute but distinct paraphyses also are seen at the inner base of the median lobes; plates minute, inconspicuous; spines

rather strongly developed; anal opening circular, near tip; paragenitals often wanting: if present, represented by from 1 to 3 glands only; dorsal pores few, scattering; transverse basal thickenings well developed, laterals separated from the central line and robust; apical ventral chitinization rather strongly developed, brown; ventral longitudinal ridges feebly developed.

Type.—Bureau of Entomology No. 14121.

Material studied: Original lot from Bloemfontein, South Africa, December, 1907, from the Hon. W. J. Palmer, director of agriculture, Orange River Colony. Food plants represented: *Gleditsia triacanthos*, *Schinus molle*, fig (two samples), almond, and quince. This material was abundantly parasitized, but none of the parasites was obtainable for identification. Specimens on *Gleditsia triacanthos* are followed in description, except as to note on paragenitals.

Additional lot from Charles P. Lounsbury, government entomologist, Cape Colony, with letter of January 29, 1908, representing material on pear, Hex River, Cape Colony; Kieffer pear, Prospect Farm, Komgha (east of Cape Colony); fig, Paarl, Cape Colony, and fig and privet from Bloemfontein.

The original lot, received through the Hon. W. J. Palmer, was submitted under the supposition that the insect might prove to be the San Jose scale (*Aspidiotus perniciosus* Comst.), and with the request that an authoritative determination be cabled to Bloemfontein. The insect proved to be entirely distinct from *perniciosus*, and evidently an undescribed species native to South Africa. The general appearance of the scale and insect is strikingly close to the San Jose scale. Even the anal plate bears a close resemblance to the San Jose scale, but lacks the second pair of lobes and presents some other minor differences. In the specimens examined of the first lot paragenitals also seemed to be entirely wanting, although later, in the case of three specimens, scattering pores were found, in some instances rudimentary.

The fact that the insect is distinct from the San Jose scale was cabled to Mr. Palmer, and a letter giving details was sent. Before the receipt of this cablegram the entomologists of South Africa, viz, Mr. Charles P. Lounsbury, Cape Colony; Claude Fuller, Natal; C. W. Howard, Transvaal, and H. Neethling, biologist, Orange River Colony, had held a conference at Bloemfontein and arrived at the conclusion that the South African insect was distinct from *perniciosus*.

The original information given by Mr. Palmer concerning the food habits of this insect is as follows:

In the first place the worst infestations met with thus far occur on the mimosa (*Acacia horrida*), acacia (*Robinia pseudacacia*), pepper (*Schinus molle*), and fig; whereas pear, pecan, and apple trees growing in the worst infested spots have either not been attacked at all, or only to a very slight extent. The distribution over such a large area as it has already spread shows that it must have occurred here for a period of at

least several years, but, in spite of careful search, no tree has been found so badly attacked that its life is threatened; no tree has been found to have actually succumbed to its attack.

The scale is apparently kept in check by an insect enemy, although up to the present no parasites have actually been discovered. In other countries where the scale has become established, it can hardly be said to be kept down by its parasites.

In letter of February 3, 1908, transmitting the report of the conference of entomologists at Bloemfontein, Mr. Neethling states that since the discovery of the insect it has become very destructive to some cultivated plants, notably the fig and privet. The list of plants which it has been found to infest, given in the report referred to, includes the following:

Privet.....	Abundantly infested.
Fig.....	Do.
Honey locust (<i>Gleditsia triacanthos</i>).....	Do.
Pepper (<i>Schinus molle</i>).....	Do.
Apricot.....	Sparsely infested.
Quince.....	Do.
Apple.....	Very rarely and sparsely infested.
<i>Acacia horrida</i>	More or less abundantly infested.
<i>Robinia pseudacacia</i>	Sparsely infested.
<i>Rhus</i> sp.....	Do.

Mr. Lounsbury's communication of January 29, with accompanying specimens, gives further interesting information relative to the insect, and considerably extends its range in South Africa, as already noted. He adds two new food plants for Bloemfontein, namely, willow and poplar. He had also found, in the material which he had studied, particularly in that from South Africa and more rarely in some of the Bloemfontein samples, scattering paragenitals. Following his suggestion the writer gave a second and most careful scrutiny to all the material, with the results in the matter of paragenitals and other features indicated in the concluding notes descriptive of all the material. Mr. Lounsbury states:

I have known the occurrence on the pear for some years and suspect that the infestation went with nursery stock sent out years ago by a certain nurseryman. But we have failed to find the scale on his place and have come to think that it might have been imported by him with French stocks before the days when we fumigated such and that it has since been eliminated. In our notes we have entered the species as "near *ancylus*" and "near *perniciosus*," but the possibility of it being the one at Bloemfontein incorrectly identified as *perniciosus* did not occur to me until I received material of the latter. I have not seen the species away from orchards or habitations, but some Orange River Colony material was found on *Rhus* and mimosa (native plants) under circumstances suggestive of its being indigenous. The pear occurrence at Komgha (east of Cape Colony) was on a few trees in one orchard, and cutting them out seems to have proved eradivative. A few branches were heavily incrustated. The one at Hex River (only 125 miles from here) is also in one orchard only, so far as I know, and here some dozens of trees show the injury by the death of inside wood and spotting of fruit. I can not compare the species with *perniciosus* for *perniciousness*.

The fact that this insect occurs on native plants, as indicated by Mr. Lounsbury, and also that it is rather abundantly parasitized, further emphasizes the probability that it is an indigenous species. Some descriptive notes of the different lots of material follow:

Original material received from W. J. Palmer, Bloemfontein (letter of November 4, 1907):

(1) On *Gleditsia triacanthos*: Type of description.

(2) On *Schinus molle* (pepper tree): Typical, except for a slightly more prominent development of dorsal pores, and a much lighter coloring of the scale secretion. When occurring on this food plant the scale is light yellowish brown, almost buff, but otherwise normal. Such variation in coloring is sometimes seen in the San Jose scale, and may be due purely to the food plant.

(3) On fig: Typical, save for a single anterior lateral circumgenital gland in two females out of eight examined.

(4) On almond: Typical, save for two rudimentary glands in one specimen. These glands in the specimens on fig and almond were not noted in the first examination.

(5) On quince: Typical.

Material received from Charles P. Lounsbury (letter of January 29, 1908):

(1) On pear, Hex River, Cape Colony, November 17, 1907, three females: Typical, except that they show scattering paragenitals, as follows:

0	0	0	0	0	0	0
2-1	0-0	0-1	1-2	3-2	1-1	0-0
1-2	1-1	1-0	1-1	1-1	1-1	0-0

Scales reddish brown, with nipple and ring as in *perniciosus*; when rubbed, exposing exuvia as in *perniciosus*.

(2) On Kieffer pear, Prospect Farm, Komgha (east of Cape Colony), September, 1905: Scale similar to last, but with central nipple and ring less prominent; pygidium rather produced or triangular; dorsal pores numerous and prominent, arranged in two or more irregular rows on each side, the first extending from the second incision. Paragenitals:

0	0	1	0	0
2-3	2-4	2-2	2-1	1-1
2-2	2-2	2-2	2-2	1-2

(3) On fig, Paarl, Cape Colony, November 8, 1907; 11 females examined: Typical in character of dorsal pores. Paragenitals absent or very few. Color of scales modified by the reddish-brown superficial layers of the bark which are carried over the scale; evidently

approximating the color of the scales of the other specimens. Paragenitals:

	0	0	0
0-0 (two specimens).	2-1	1-0	0-1 (three specimens).
0-0	2-1	0-0	0-0
0	0	0	
1-1	1-0	1-1 (two specimens).	
1-0	1-3	1-1	

(4) On fig, Bloemfontein, November 29, 1907: Substantially typical, one specimen out of six exhibiting two paragenital glands, namely, one each of posterior laterals; with the other five specimens no glands present. Mounted material only.

(5) On privet, Bloemfontein, October, 1907: Typical, except for the presence of scattering paragenitals as follows:

0	0
1-2	3-3
1-1	2-2

Slide mount only, showing two females.

All of this material evidently belongs to the same species. The five lots originally studied show practically no paragenital glands, also general uniformity in dorsal pores, except in the case of specimens on pepper tree.

In all the later material received from Mr. Lounsbury scattering paragenital glands are found in most of the individuals examined. The specimens on fig from Cape Colony and Bloemfontein show a general absence of these glands, or, if present, represented mostly by single glands. In the case of the other food plants, both from Cape Colony and from Bloemfontein, the paragenitals are very scattering, with one or more groups often entirely wanting. Taking the reasonable supposition that all this material represents the same species—and there seems to be no occasion to doubt this judgment—we have evidently a case of a species either in a transition stage, in the matter of the presence or absence of paragenitals, or slightly variable in this feature. The paragenital glands are developed only in the adult stage of the female, and it has long been the belief of the writer that they can not be given very much specific importance. They are always subject to considerable variation, and future studies may prove that, in certain instances where species have been separated chiefly on the presence or absence of these glands, the separation is not justified, as possibly illustrated in the case of *lataniæ* and *camelliæ*. In the matter of dorsal pores, the specimens on Kieffer pear, Cape Colony, show a rather unusual development, and the pygidium in the examples studied is rather more produced or triangular; otherwise the agreement is close. Some slight variation in the number of dor-

sal pores is seen in other specimens, notably in the case of the pepper specimens already referred to. This greater development in the number of dorsal pores is not a character of great importance, and much variation in this respect is seen in other species. The abundance of dorsal pores seems to be governed to some extent by climatic conditions, a marked increase being often noted in specimens from arid districts.

The discovery of scattering paragenitals brings this species into close relationship with the *ancylus* native to North America, and places it in a group of species hitherto especially characteristic of the New World. It is interesting to note also that a related but a much more strongly chitinized species, lacking paragenitals, has been recently received from Transcaspian Russia. We know too little of the scale-insect fauna of Asia and Africa to be able to generalize as to what types of species are likely to be met with.

ASPIDIOTUS (DIASPIDIOTUS) COURSETIÆ n. sp.

(Plate III, fig. 2.)

Scale of female: 1.5 mm. in diameter, nearly circular, of medium density, depressed; color grayish, more or less soiled by adhering extraneous matter; exuviae sublateral, covered.

Scale of male: Similar, of normal shape.

- *Adult female*: Length less than 1 mm., of normal peg-top shape, not chitinized; *anal plate* slightly more chitinized than body except for lobes and apical and basal thickenings; median lobes only present; laterals obsolete as in *ancylus*; outer shoulder of median lobes prominent, inner shoulder minute, sometimes practically wanting; paraphyses of two incisions beyond lobes strongly developed; inner paraphyses of first incision terminating in a distinct oval knob lying at right angles to the line of the thickening; spines normal, fairly long; anal opening very minute and in line with the knobbed terminals of the inner paraphyses of first incision. Paragenitals: Anterior laterals, 1-3; posterior laterals, 0-1; dorsal pores few in number, inconspicuous; transverse basal thickenings of dorsal surface in three parts, consisting of a long, straight central line, sometimes broken at middle, and two stronger lateral thickenings in the form of a double curve. The ventral apical divaricating chitinized bands broad and undivided.

Type.—Bureau of Entomology No. 14002. On *Coursetia glandulosa*, Hermosillo, Mexico; collected by Albert Koebele April 23 and 24, 1897 (Koebele No. type material, 1713).

NOTE.—This species is closely allied to *Aspidiotus subsimilis* Ckll. The latter differs in having a more produced pygidium and lobes, the latter without inner shoulder, anus midway of first thickening, paragenitals absent, and in minor characters. This species is scarcely more than a variety of *subsimilis*.

ASPIDIOTUS (DIASPIDIOTUS) TRANSCASPIENSIS n. sp.

(Plate IV, fig. 1.)

Scale of female: 1.5 mm. in diameter, subcircular, of a yellowish or buff color. Exuviae orange, exposed when rubbed or old.

Scale of male: Of normal oval shape, similar in color to the female.

Adult female: Broad, oval, 1 mm. in length; *anal plate* broad, rounded; median lobes only represented; laterals wanting or rudimentary as in the case of *ancylus*; median lobes strongly chitinized, with very deep outer notch forming a rather distinct lobule; inner notch wanting; the two lateral incisions shallow, broad, and with very heavy, robust, bordering paraphyses or thickenings; paraphyses of first incision particularly large, especially the inner one; of second incision, much smaller; plates inconspicuous; spines not especially developed, normal; anal opening near tip, very minute; paragenitals wanting; dorsal pores few, inconspicuous, scattering; median line of basal thickenings subhyaline, inconspicuous; laterals narrow, well chitinized; two prominent longitudinal thickenings bordering the center of the pygidium; ventral thickenings normal, well chitinized.

Type.—Bureau of Entomology No. 8216. On some old dried bark of *Populus*, from Transcaspian Russia, supposed to be from C. Ahnger, of Ashkabad, received November, 1898.

In its rudimentary second and third lobes this species is related to *ancylus*. The important characters are the strongly chitinized median lobes, with prominent external lobule and the prominent longitudinal thickenings, and the absence of paragenitals. In the latter character it falls with the South African species *africanus*, which, however, it does not otherwise closely resemble.

ASPIDIOTUS (HEMIBERLESIA) EPIGÆÆ n. sp.

(Plate IV, fig. 2.)

Scale of female: 1.5 mm. in diameter, subcircular, elevated, more or less conical; exuvia covered but showing as a yellowish spot; larval excretion persistent as a central nipple; color gray, often with purplish tinge, more or less annulated with lighter.

Scale of male: Normal shape, otherwise resembling the female.

Adult female: 0.6 to 0.7 mm. wide by 0.9 mm. long; normal peg-top shape, hyaline in balsam mount; *anal plate* 0.30 to 0.34 mm. in diameter at base, rounded, nearly hyaline; two pairs of well-developed lobes with sometimes a rudimentary third spear-shaped lobe; median lobes much larger than second pair and strongly chitinized, brown, the chitinization ending abruptly at base, not extending into segment except slightly at inner side, giving the base a somewhat irregular oblique termination; median and second pairs of lobes with two subequal small notches; second pair of lobes, and third, if present,

practically hyaline; median pair of lobes together 0.036 mm. in diameter; incisions normal; paraphyses nearly wanting, represented by mere points of chitinization; plates very little exceeding lobes, not very strongly developed but of the general *Hemiberlesia* type, two median narrow, two broader first notch, then three broad followed by two or three simple plates, all plates save last being fingered at tips; spines normal; anal opening large, nearly equaling in size one median lobe, one and one-half lobe's length distant from base of median lobes; paragenitals scattering, linearly arranged, 0-1, 4-7, 4-6; dorsal pores very few, scattering; basal thickenings not prominent, but slightly chitinized, divaricated ventral thickenings not extending beyond anal opening.

Type.—Bureau of Entomology No. 14135, on the ground laurel or trailing arbutus (*Epigæa repens*), Chain Bridge, Va. (near Washington, D. C.), collected by J. G. Sanders, May 6, 1906. Collected also on the same food plant, Sugar Grove, Ohio, by Bertha C. Hite, and donated by Mr. J. G. Sanders.

NOTE.—This species is evidently related to *lataniæ* of Signoret, but is a smaller species and differs in the notable and peculiar chitinization of the median lobes. It presents considerable variation, some of the smaller or incompletely developed specimens of the last stage of the female showing less chitinization and approaching rather closely in superficial appearance to *townsendi*, and it might easily be determined as this latter species. Its host-plant and occurrence in woodlands indicate that it is a species native to North America.

ASPIDIOTUS (HEMIBERLESIA) MITCHELLI n. sp.

(Plate V, fig. 1.)

Scale of female: Length, 1.5 mm.; subcircular to broad oval, strongly convex, and of the general *camelliæ* type; secretory matter rather dense, color dull yellowish, due chiefly to the extraneous matter taken up from the surface; exuviae yellowish brown, near the anterior end usually covered. Ventral scale a distinct white flocculent patch, thinnest at the center.

Scale of male: Similar in general appearance to that of the female, but of the normal elongate shape.

Adult female: Normal top-shaped, 0.75 mm. in diameter; in balsam hyaline; *anal plate* a little more yellowed than body, broad, not produced; three pairs of lobes; median lobes truncate, not converging, with two lateral shoulders, separated by a lobe's width, relatively much smaller than the lobes of *camelliæ*; second lobe minute, spear-shaped, often with outer lateral shoulder; third lobe narrow, spiniform; thickenings of first and second incisions present, subequal, and



FIG. 1.—ASPIDIOTUS (DIASPIDIOTUS) TRANSCASIENSIS.



FIG. 2.—ASPIDIOTUS (HEMIBERLESIA) EPIGÆÆ.

ANAL PLATES OF NEW SCALE INSECTS.

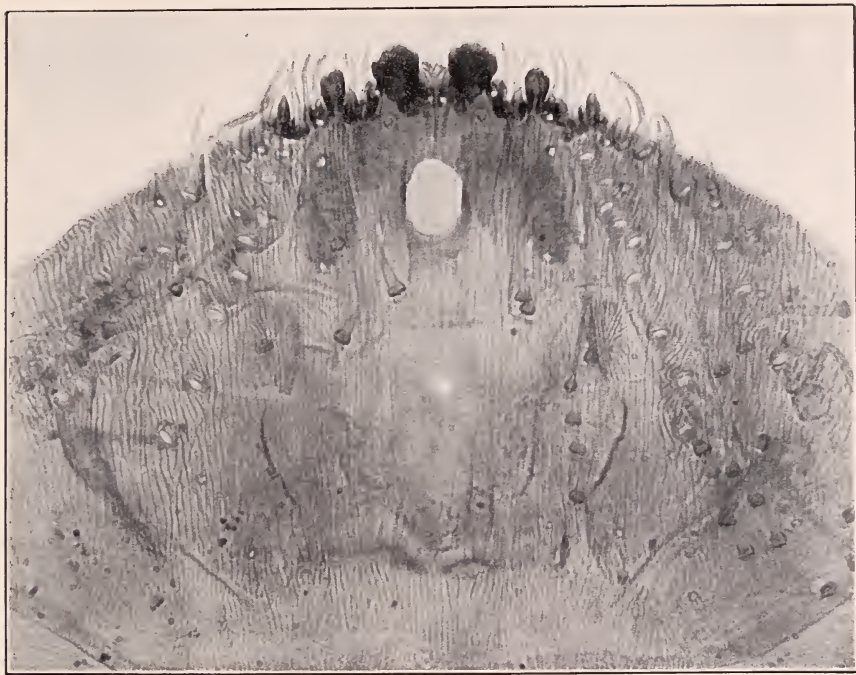


FIG. 1.—ASPIDIOTUS (HEMIBERLESIA) MITCHELLI.

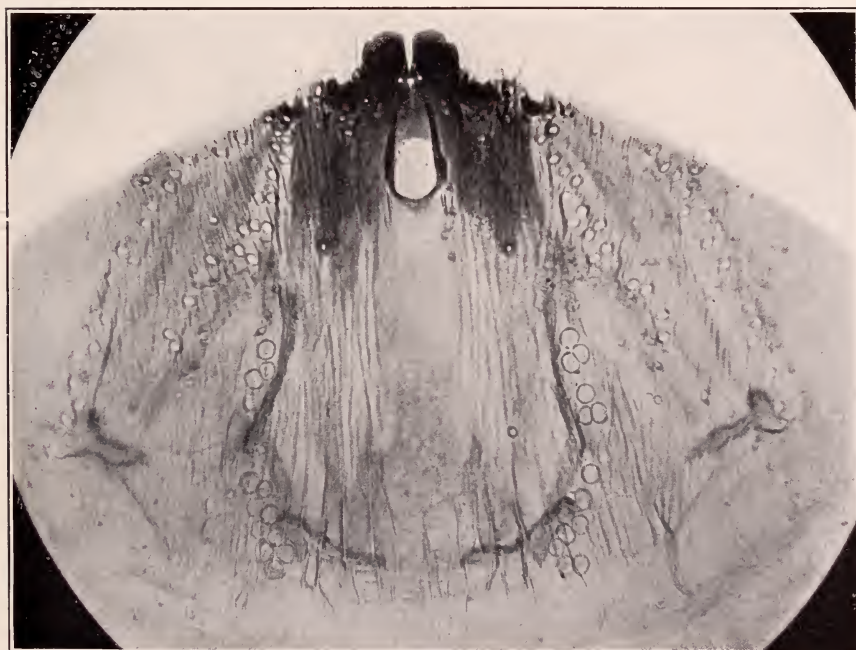


FIG. 2.—ASPIDIOTUS (HEMIBERLESIA) POPULARUM.

ANAL PLATES OF NEW SCALE INSECTS.

together with lobes a little more yellow than the pygidium, but not strongly chitinized; plates numerous, long, filiform, central ones simply branched; spines short, inconspicuous; basal dorsal thickenings not strongly developed or chitinized; anal opening much larger than median lobes, broad oval, about one lobe's length from tip; paragenital pores wanting; dorsal pores not numerous or conspicuous, but with very long (one-half width of pygidium) internal tubes; ventral thickening of integument extending from median lobes practically wanting.

Type.—Bureau of Entomology No. 7695. On thick, narrow, slightly oblanceolate leaves about $1\frac{1}{2}$ inches long; collected by Mr. Charles P. Lounsbury, at Mitchells Pass, South Africa, January 29, 1897.

NOTE.—This species, in character of scale and last segment, is distinctly a *Hemiberlesia*. The anal opening is relatively as large as in *camelliæ*, but the median lobes are much smaller, and the chitinization of the last segment is distinctly less than in *camelliæ*. The scale occurred scatteringly on both surfaces of the leaves.

ASPIDIOTUS (HEMIBERLESIA) POPULARUM n. sp.

(Plate V, fig. 2.)

Scale of female: Length, 2 mm.; broad oval, of the *camelliæ* type; strongly convex; exuviae near the anterior end, dark brown, the larval exuvia nearly black, normally covered; secretory matter yellowish white, very dense.

Scale of male: Length, 1 to 1.5 mm.; of the normal oval shape, with the larval exuvia showing prominently at one end through scanty secretory covering.

Adult female: Normal top-shaped, in balsam hyaline; 1.5 mm. in diameter; *anal plate* broad, rounded, tip slightly more yellowed than the body; median lobes large, close together, slightly converging, and with two distinct lateral shoulders, often lost in old worn specimens; second and third lobes of *ancylus* type or practically wanting; thickenings of first and second incision prominent, subequal; plates rather short and inconspicuous, doubtless partly lost or reduced by age and use; spines normal; anus very large, broad oval, distinctly larger as a rule than median lobes; paragenitals in four groups, anterior groups 3-9, posterior groups 3-8, often nearly continuous; dorsal pores very numerous, chiefly confined to two irregular double lateral rows extending from the second incision, and a third inconspicuous incision; basal dorsal thickening linear, not especially prominent.

Type.—Bureau of Entomology No. 8370. On cottonwood, from Deming, N. Mex., through Prof. T. D. A. Cockerell, February 9, 1897.

Additional specimens, also on cottonwood, received from Professor Cockerell from Phoenix, Ariz., November 2, 1899.

NOTE.—This species is very closely allied to *camelliæ* and *lataniæ*. In the possession of paragenital pores it comes nearest to the latter species. It differs notably in the great development of the dorsal pores, which seems to be a common characteristic of scale insects in very dry climates, and in the sparsity and shortness of the plates. It is, furthermore, a rather larger species than either of the two mentioned.

AONIDIA JUNIPERI n. sp.

(Plate VI, fig. 1.)

Scale of female: Thin, whitish, slightly tinged with yellow, 1 mm. in diameter, circular in outline, slightly convex. First exuvia very light yellow, easily lost, showing the much darker second stage as a circular central spot through the opening. Second exuvia very large, dark resinous, almost reddish, strongly chitimized and inclosing the adult female, which can be easily removed through the much thinner and delicate ventral skin of this stage.

Scale of male: Unusually large, oval, as large as the second exuvia of the female. Coloration and texture as in female.

Adult female: A little more than half a millimeter in diameter (0.54), of normal peg-top shape, not elongated nor chitimized. *Anal plate*, 0.20 mm. broad by 0.14 mm. long; scarcely chitimized, subhyaline; two small apical, nearly contiguous lobes, laterals wanting; lateral teeth wanting save as produced by the indentations containing the large peripheral dorsal pores, which form, especially toward the apex, distinct incisions; paraphyses and plates wanting; spines minute; anal opening remote from tip; paragenitals wanting; dorsal pores represented by a large central pore lying between the base of the apical lobes and five large lateral pores along the periphery of either side; some few other pores present, but inconspicuous; ventral thickening inconspicuous save the uniform slight chitimization of the pygidium.

Type.—Bureau of Entomology No. 14123. On the fruit of *Juniperus* sp.; from E. G. Titus, Logan, Utah.

This species belongs to the genus *Aonidia*, and is ovo-viviparous, the bodies of the females examined being filled with young ready for emergence.

ASPIDIOTUS (TARGIONIA) CHENOPODII n. sp.

(Plate VI, fig. 2.)

Scale of female: 1.5 to 2 mm. in diameter, subcircular, convex; light buff in color, the secretion covering the larval exuvia whitish; with the loss of the larval exuvia, the light-orange second exuvia appears

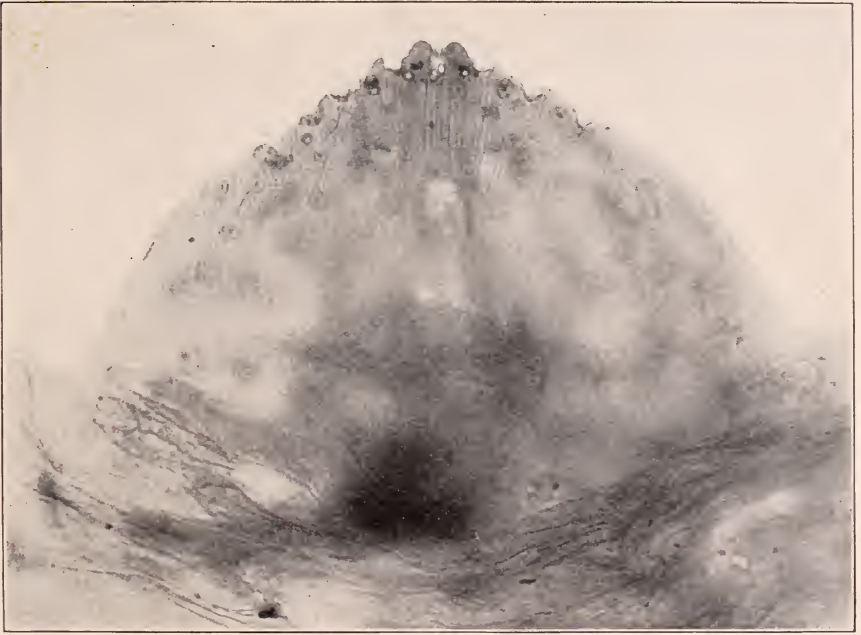


FIG. 1.—*AONIDIA JUNIPERI*.



FIG. 2.—*ASPIDIOTUS (TARGIONIA) CHENOPODII*.

ANAL PLATES OF NEW SCALE INSECTS.



as a conspicuous spot; ventral scale attached to the bark, white, rather abundant.

Scale of male: Elongate, sides nearly parallel; length 1 mm., sometimes slightly more; same general characters as the female; except that the lower secretion remains attached to the upper, forming a definite flattish sac or cocoon which easily separates from the plant.

Adult female: Nearly circular, 1.3 mm. wide by 1.5 mm. long in the larger specimens; hyaline, except anal plate; parastigmatic glands wanting. *Anal plate* about 0.4 mm. in diameter, normally shaped, but slightly chitinized; a single pair of rather contiguous narrow median lobes, chitinized, brown, with a more or less distinct basal chitinized prolongation; lobes oblique at tip, with a produced inner apical angle, closely reproducing the characteristics of the same lobes of *dearnessi*; second and third lobes represented by mere projections; lateral teeth represented by the projections just referred to, which are homologous with the second and third lobes, and by a minute general serration of the edge of the anal plate; first incision deep and containing two short but easily distinguishable plates; second and third incisions minute; paraphyses wanting; plates, except in first incision, as noted, minute or wanting; spines normal; anal opening large, oval, one-third from tip; paragenitals wanting; dorsal pores minute and inconspicuous; basal thickenings inconspicuous or wanting; ventral thickenings not showing more than the generally suffused chitinization of the anal plate, the longitudinal thickenings distinctly inclosing the oval vaginal area.

Type.—Bureau of Entomology No. 14143. Coolabah, New South Wales, on *Chenopodium*; collector, J. G. Smith.

NOTE.—This species is very close structurally to *dearnessi* Ckll., but is much less chitinized. The prominent median lobes are almost exactly like those of *dearnessi*. The latter species, however, has five prominent lateral projections instead of the two inconspicuous ones exhibited by *chenopodii*. The dorsal pores of *chenopodii* are much less conspicuous than in the case of *dearnessi*; the first incision is deep, the plates in this incision are larger and more distinct, and there are other minor differences which, taken together with the wide separation geographically and the different food plants, perhaps warrant giving a specific name to the New South Wales material.

CHIONASPIS MICROPORI n. sp.

(Plate VII, fig. 1.)

Scale of female: 2.5 mm. long, of the normal shape, expanding posteriorly, usually more or less curved; secretion white, smooth, and dense; with distinct ventral scale.

Scale of male: About 1 mm. in length, normally shaped, with distinct median carina.

Adult female (dried specimens): Dark purple, with the eggs or young also dark purple; length 0.9 to 1 mm.; breadth at widest part 0.4 to 0.5 mm., of normal *Chionaspis* type, tapering anteriorly; body nearly hyaline; parastigmal glands variable, sometimes as many as 9. *Anal plate* broader than long, 0.26 by 0.38 mm.; in older specimens distinctly and generally chitinated and brown, nearly hyaline in recently matured females; median lobes touching at base and widely divaricating toward tips; latter rounded. Inner lobe of first lateral pair one-half width of median; outer lobes, same pair, very short and much smaller; second lateral pair represented by the inner lobe only, which is similar to the same lobe of the first lateral pair; outer lobe apparently practically wanting; lateral lobes directed distinctly toward apex of segment; lateral teeth represented only by the projections laterad of the large oblique marginal glands; incisions inconspicuous; paraphyses wanting; plates, including the median, 2, 2, 2, 2, 4-5; spines normal; anal opening one-third or less from base, circular, about the diameter of the first lateral lobe; paragenitals 12-13, 20-29, 18-22; oblique marginal pores 1, 2, 2, 2; dorsal pores small, nearly circular; inner row or group next to paragenitals 7-9; irregular row extending from third incision, more or less in two groups, of some 15 pores altogether; followed by an exterior row of some 12 pores, number of pores, however, variable; basal thickenings inconspicuous or wanting; ventral thickenings the suffused chitination of the anal plate already noted, slightly heavier below median lobes.

Type.—Bureau of Entomology No. 14144. Collected on poplar, probably *Populus tremula*, at Wu Tai Shan, Shansi, China, by F. N. Meyer. Received February 26, 1908.

LEUCASPIS INDICA n. sp.

(Plate VII, fig. 2.)

Scale of female: White, elongate, narrow, convex, flattened at tip, easily falling from the insect beneath.

Scale of male: Not noted.

Adult female: Entirely inclosed within the swollen, strongly chitinated second stage, latter 0.5 to 0.6 mm. long, elongate oval, dark reddish brown. Adult female hyaline, elongate, sides subparallel. *Anal plate* very minute, about 0.1 mm. in diameter, rounded, longitudinally striate. Margin with a series of elongate plate-like processes; lobes, incisions, and paraphyses wanting. The processes referred to are truncate or slightly spatulate at tip, and are of two lengths; the long ones are the second, fifth, and ninth from the center and are homologous to the lobes of other species; between the median long pair is a central short pair, then beyond the first long plate two other short ones, and beyond the second long plate three



FIG. 1.—*CHIONASPIS MICROPORI*.

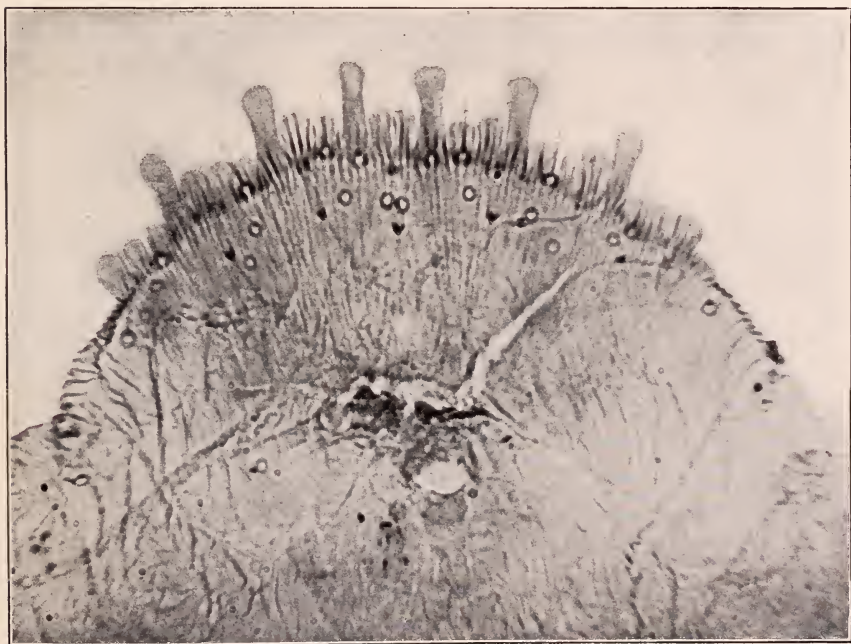


FIG. 2.—*LEUCASPIS INDICA*.

ANAL PLATES OF NEW SCALE INSECTS.

short ones, and beyond the third three short ones. The marginal spines are normal, and within these is a submarginal row of short spines; anal opening large, nearer base than tip of segment; paragenitals, dorsal pores, and basal and ventral thickenings wanting.

The 5 or 6 abdominal segments preceding the anal plate are very narrow, rather sharply defined, and covered with cross or longitudinal striæ.

Type.—Bureau of Entomology No. 14125. On mangoes imported from India, at Miami, Fla., collected by Mr. P. J. Wester, of the Subtropical Laboratory and Garden of the Department of Agriculture, and from Mayaguez, P. R., through D. W. May.

NOTE.—This mango scale is a very interesting species, apparently undescribed, and evidently imported from India with the original sending of the variety of mango on which it occurs, namely, Seed and Plant Introduction and Distribution No. 7108, the *Sundershah*. It seems to belong to the genus *Leucaspis*, but the failure to find the male scale leaves this reference in some little doubt. It is certainly unlike any described species of this genus. It occurs thickly massed in the cracks of the bark, and the reddish inflated skins are the second stage, which include the adult insect in a sort of sac, and look like minute eggs or seeds, the whitish waxy covering adhering very loosely and in many cases having been lost off. It has every appearance of being a serious pest, from the dense infestation exhibited.

MYTILASPIS CHILOPSIDIS n. sp.

(Plate VIII, fig. 1.)

Scale of female: More than a millimeter in length, narrow, light purplish in color.

Scale of male: Similar, about one-half the size of the female.

Adult female: A little more than a millimeter long, of normal *Chionaspis* shape, expanding notably posteriorly; anterior and lateral margins smooth, normal. *Anal plate* much broader than long, and but slightly chitinated. Lobes limited to one prominent median pair. Laterals obsolete or represented by slight tooth-like projections. Margin of pygidium somewhat toothed, caused by the projections over each of the large marginal oval pores. Incisions inconspicuous; paraphyses wanting. Plates: 2 median followed on either side by a group of 4 or 5, then 2 or 3; plates somewhat longer than lobes. Spines normal; anal opening very near base of segment. Paragenitals: Anterior 5; anterior laterals 7 to 10; posterior laterals 7 to 9 (from examination of two females). Large marginal pores occurring in three pairs, two each, with a single pair near the base of the segment. Large scattering circular or slightly oval pores over the general area of the pygidium. Basal thickenings wanting; ventral

thickenings limited to a slightly chitinized band about twice the width of the median lobes, extending slightly beyond the anal opening.

Type.—Bureau of Entomology No. 7218. Scatteringly infesting a small section of a plant doubtfully identified as *Chilopsis linearis*; collected by C. H. T. Townsend in Tehuantepec City, Mexico, May 26, 1896.

NOTE.—The females of this insect were gravid with young at time of collection. The distinguishing feature is the absence of the lateral lobes in connection with the rather large prominent median pair.

PARLATORIA MANGIFERÆ n. sp.

(Plate VIII, fig. 2.)

Scale of female: Moderately dense, dark brown, lighter at the edges, oval in outline, usually with slight apical extension; larval exuvia dull greenish. Length 1.5 mm.; breadth 1 to 1.25 mm.

Scale of male: Oval, slightly lighter colored, 1 to 1.3 mm. long by about 0.8 mm. broad. Exuvia more distinctly and purely green than in the case of the female, forming quite a striking contrast with the dull brown of the secretion.

Adult female: 0.65 mm. by 0.75 mm.; of normal rounded, peg-top shape; hyaline, save the anal plate. *Anal plate* 0.45 mm. broad at base by 0.25 mm. long; rounded, rather strongly chitinized throughout median area and marginally; general structure very similar to *pergandei*. Lobes of the *pergandei* type, rather more chitinized. Three pairs of lobes with strong outer shoulder, median lobes with minute inner shoulder also; fourth and fifth lobes triangular, terminating in a point as in *pergandei*; lateral teeth represented by irregular serrations beyond lobes; incisions normal; paraphyses represented by the semilunar chitinization at the base of the lobes, unusually heavy; plates resembling those of *pergandei* in general, i. e., two narrow central plates, and two narrow plates in the first and three in the second incision, posterior one minute; the third incision bears three broad, triangular plates, serrated on the exterior margin; following the fourth lobe are four or five similar exteriorly serrated plates; spines normal; anal opening narrow, halfway between tip of segment and vaginal orifice; paragenitals wanting; parastigmals represented by a group of 8 to 10 pores on the inner side of each stigma; dorsal pores large and numerous, represented by 5 more or less regular rows of pores on either side of the center; the central row 3 to 4, the second row 5 to 6, third 8, fourth and fifth scattering. Marginal oval pores decreasing in size from tip to base of segment; basal thickenings practically wanting; ventral thickenings represented by a broad suffused chitinization extending from the tip to the base of segment, and more or less along the margin.

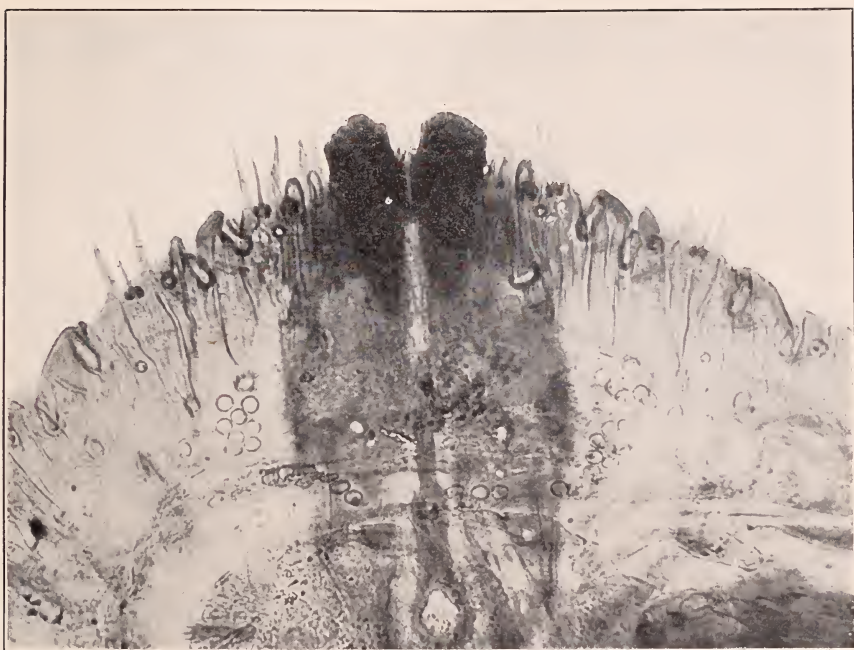


FIG. 1.—MYTILASPIS CHILOPSIDIS.



FIG. 2.—PARLATORIA MANGIFERÆ.

ANAL PLATES OF NEW SCALE INSECTS.

Type.—Bureau of Entomology No. 14128. On mango; collected in the Department greenhouses, Washington, D. C., January 28, 1908, by J. G. Sanders, in course of quarantine inspections. Dr. L. Reh, of Hamburg, sent this species for determination June 27, 1904, as from Singapore.

NOTE.—This species is a strongly chitimized *pergandei* lacking paragenital pores and exhibiting a much greater development of dorsal pores. In this last feature it resembles some of the varieties of *pergandei*. It is further distinguished by the more produced, tapering, exteriorly serrated lateral plates occurring in the incision posterior to the fourth lobe, and also on the margin of the segment anterior to this lobe. The large number of small parastigmatic pores is also a marked character.

It occurs massed as thickly as may be on the young mango twigs, and evinces the prolificness characteristic of the genus. It is undoubtedly an offshoot of *pergandei*, and may not deserve more than varietal status.

PARLATORIA PYRI n. sp.

(Plate IX, fig. 1.)

Scale of female: 1 mm. to 1.25 mm. in length, oval; exuviae of larval and second stage and supplementary secretion normal to the genus, the secretion, however, usually terminal, but its position varies somewhat as affected by irregularities of the bark, sometimes sublateral and sometimes more or less inclosing the posterior half at least of the second exuvia. Larval exuvia purplish-green; second exuvia dark olive, almost black, more or less overlaid with a grayish secretion; supplement yellowish.

Scale of male: Larval exuvia as in female; supplemental area broad, circular.

Adult female: Of the normal peg-top shape, 0.8 mm. long by 0.6 mm. broad, hyaline. *Anal plate* distinctly triangular, very slightly chitimized; two pairs of lobes, compressed or close together, the median more than twice the size of the laterals, and both pairs with a deep exterior shoulder; second pair of lobes much lower than median pair; edge of pygidium beyond plates, irregularly obtusely serrated; incisions shallow and inconspicuous; paraphyses wanting, or indicated by a small point of chitinzation at inner end of first and second lateral marginal pores; plates short and inconspicuous, not exceeding lobes, and extending a short distance laterally beyond lobes; spines normal; anal opening fairly large, circular, subcentral or nearer base than tip of pygidium. Paragenitals: Anterior group 1 to 4, anterior laterals 8 to 10, posterior laterals 8 to 12. The large oval marginal pores characteristic of the genus are present, 5 to 6 on either margin of the anal plate, with one central one between the median lobes, continued

also, somewhat smaller, on all the abdominal segments, with, on these segments and also to a less extent on the pygidium, numerous smaller oval submarginal pores. Basal and ventral thickenings practically wanting.

Type.—Bureau of Entomology No. 14115. On pear, Chefoo, China, collected October 4, 1901, by the writer. Also infesting cuttings of apple and soft pear, received from the Province of Liao Yang, Manchuria, through F. N. Meyer (S. P. I. & D. Nos. apple, 20276, 20280; soft pear, 20244 and 20280). Collected by Mr. J. G. Sanders in the course of inspection of Department importations, March 21, 1907.

NOTE.—In the case of the Meyer importations this insect was found very scatteringly present on the cuttings of pear and apple referred to, principally the former, and was associated with the San Jose scale, which was even more sparsely represented. Curiously enough, also, this new *Parlatoria* bears a close superficial resemblance in the balsam mounted female to the San Jose scale, and particularly in the shape of the anal segment and of the produced tip, with two pairs of compressed or closely placed lobes, which are almost of the identical size and shape of *perniciosus*. The plates also are just about the same size and extent as in *perniciosus*. While distinctly a *Parlatoria*, this species lacks the abundant and striking development of the plates which is usually characteristic of the genus. Its occurrence with the San Jose scale and in somewhat greater numbers even than the latter species, and particularly its habitat in the North Temperate region, would indicate, in connection with its host relations, that it has very great possibilities for evil should it gain foothold on this continent. The genus *Parlatoria* is noted for its enormous powers of multiplication, and the possibilities of damage as seen in the case of the chaff scale (*Parlatoria pergandei* Comst.) and the date-palm scale (*Parlatoria blanchardi* Targ.) indicate that this Manchurian *Parlatoria* might develop into a much more dangerous insect even than the San Jose scale. While no parasitism was noted in the case of the *Parlatoria*, some of the San Jose scales associated with it had been parasitized, the parasite, however, not being identifiable from the single fragment found, which was, however, referred by Doctor Howard to the genus *Aphelinus*.

PARLATORIA CHINENSIS, n. sp.

(Plate IX, fig. 2.)

Scale of female: 1 mm. in diameter or less, subcircular, exuviae eccentric, dark metallic olive, similar in general characters to *P. pyri*.

Scale of male: Not seen.

Adult female: About 0.6 mm. broad by 0.7 mm. long (probably old gravid female considerably larger); normally shaped. *Anal plate*

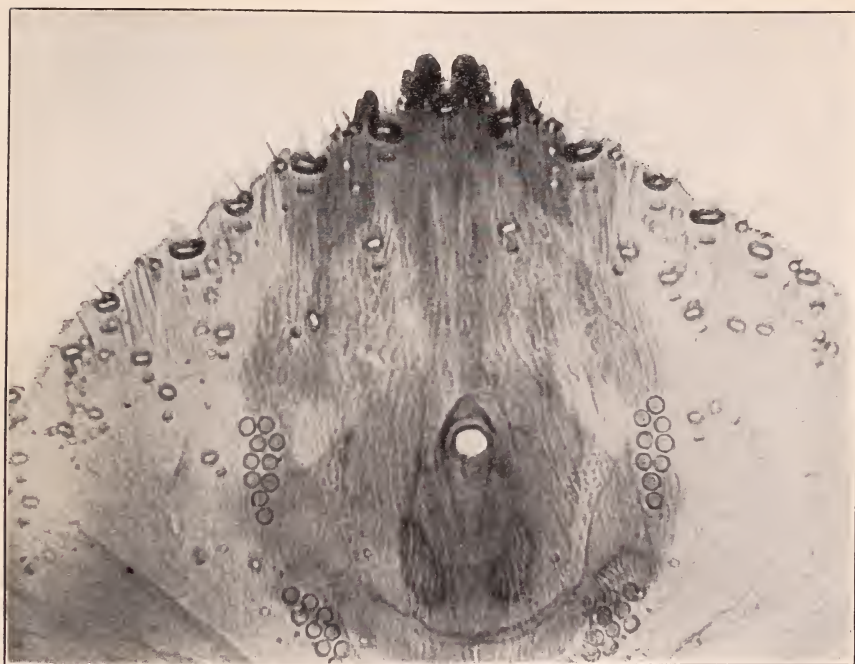


FIG. 1.—*PARLATORIA PYRI*.



FIG. 2.—*PARLATORIA CHINENSIS*.

ANAL PLATES OF NEW SCALE INSECTS.

broad, triangular; width 0.3 mm., length 0.24 mm.; more chitinated than *pyri*: lobes in two pairs; median large, each 0.15 mm. broad, obtusely pointed; inner margin with one notch, outer margin oblique, with four or more fine teeth; second lobe much smaller and lower than median, close to the latter, outer margin oblique, with 2 to 4 minute teeth; incisions normal; paraphyses represented by two rounded, knobbed chitinous processes attached to the inner end of each of the first and second lateral marginal lunar pores, bringing them at or near the outer bases respectively of the median and lateral lobes; plates inconspicuous: between the median lobes and in the first lateral incision two very short, scarcely discernible simple plates; three slightly longer simple plates occur in the second incision; beyond the second incision no plates easily discernible; spines normal; anal opening subcentral, situated just in front of vaginal opening, equaling in diameter width of median lobe; paragenitals in four groups of about 6 pores each, the anterior group apparently not represented in the specimens examined; basal thickenings a distinct narrow line, oblique lateral portion of same character as central and scarcely separated from latter; ventral thickenings diffused, normal.

Type.—Bureau of Entomology No. 14138. On crab-apple, Tientsin, China, October 11, 1901; collector, C. L. Marlatt.

NOTE.—This anomalous *Parlatoria* was first collected by the writer on a small tree, possibly a crab-apple, growing near the railway station at Taira, Japan, August 30, 1901. This tree was thickly infested, and this was the only example of this insect found in Japan. In China the writer collected it at Chefoo on *Hibiscus* (October 4, 1901), and later, October 11, on crab-apple at Tientsin. The latter lot has been indicated as the type material. What is evidently this insect was also collected by the writer (March 12, 1902), in Cairo, Egypt, on an unknown plant, which it infested in conjunction with *Parlatoria affinis* Newst. The Egyptian variety differs slightly in the exterior serration of the median lobes, these serrations or notches being reduced to two or three instead of four or more, and the central lobular projection is somewhat larger. The paragenitals also are less abundant, ranging as follows: 0, 0-3, and 1-2.

The same insect was found on plants imported for the Department of Agriculture by F. N. Meyer, from Peking and northern China, namely, on *Xanthoxylon*, received May 2, 1907, on *Thuja orientalis*, received March, 1908, and on jujube, received April 21, 1908. From these records it is evident that it is a common and widespread species in northern China, and probably will be found to occur throughout eastern Asia. The Egyptian variety may have been a recent importation, or the range of the species may be much wider in the Old World than that indicated.

This insect is remarkably like *Parlatoria pyri* in general appearance and characters, and is very likely closely related to the latter

species, perhaps presenting merely a variety. It differs, however, very notably in the character of the median lobes, which in *pyri* are of the normal *Parlatoria* type, with a deep prominent outer shoulder on each of the lobes. It also differs from *pyri* in the presence of the chitinized processes or paraphyses, which in *pyri* are usually wanting or only faintly indicated, and in the practical absence of the smaller pores, which in *pyri* are found rather abundantly near the margin of the anal and other segments. The anal plate is a little more heavily chitinized, thus bringing out more prominently the basal and ventral thickenings. It occurred very scatteringly, altogether but four females being secured. Like *pyri*, the tip, at a superficial glance, reminds one strongly of *perniciosus*, the effect being produced by the very much smaller, lower, and closely placed second lobes. This species diverges still farther than *pyri* from the normal *Parlatoria* characters. The sparsity of plates and the practical absence of the branched plates along the margin of the anal and other segments, and the sparsity of submarginal and marginal pores, are all features which differentiate it from the normal type of *Parlatoria*. The broad lunar marginal pores of the anal segment, however, are distinctly of the *Parlatoria* character, and the secretions and exuviae are distinctly those of *Parlatoria*.

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